

## DATA SHEET

### LS Programmable Logic Controller RTD Input Option Board

**XGB XBO-RD01A**



- When using LSIS equipment, thoroughly read this datasheet and associated manuals introduced in this datasheet. Also pay careful attention to safety and handle the module properly.
- Store this datasheet in a safe place so that you can take it out and read it whenever necessary.



Davis Controls Ltd is the authorized distributor of LSIS equipment and control solutions throughout Canada.

Founded in 1933, Davis Controls represents a strong and balanced portfolio of world class products. From head office facilities located in Oakville, Ontario, Davis Controls connects customers seeking high quality automation solutions with global manufacturers of state of the art products.

You can contact us at:

Toll Free Canada: 800.701.7480  
Toll Free USA: 800.388.4159  
Email: info@daviscontrols.com  
Website: www.daviscontrols.com

Thank you for your business and your interest in LSIS solutions.

LS constantly endeavors to improve our products so that information in this datasheet is subject to change without notice.

The date of issue: 2011.5  
10310001191 Ver 1.1

#### ■ Safety Precautions

- ▶ Safety Precautions is for using the product safely and correctly in order to prevent the accidents and danger, so please go by them.
- ▶ The precautions explained here only apply to this module. For safety precautions on the PLC system, refer to User's manual.
- ▶ The precautions are divided into 2 sections, 'Warning' and 'Caution'. Each of the meanings is represented as follows.



If you violate instructions, it can cause death, fatal injury or a considerable loss of property



If you violate instructions, it can cause a slight injury or a slight loss of products

- ▶ The symbols which are indicated in the PLC and User's Manual mean as follows.
  - ▶ This symbol means paying attention because of danger of injury, fire, or malfunction
  - ▶ This symbol means paying attention because of danger of electric shock. Store this datasheet in a safe place so that you can take it out and read it whenever necessary. Always forward it to the end user

#### ■ Handling Precautions

- ▶ Don't drop or make impact.
- ▶ Don't detach PCB from case. It may cause problem.
- ▶ When wiring, let no foreign material go into the module. If it goes into the module, remove it.
- ▶ Don't detach the module from slot while power is on



#### Warning

- ▶ Do not contact the terminals while the power is applied. Risk of electric shock and malfunction.
- ▶ Protect the product from being gone into by foreign metallic matter. Risk of fire, electric shock and malfunction.
- ▶ Risk of fire, electric shock and malfunction. Risk of injury and fire by explosion and ignition.

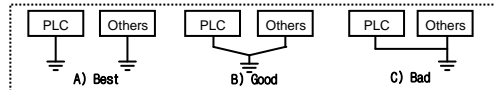


#### Caution

- ▶ Be sure to check the rated voltage and terminal arrangement for the module before wiring work. Risk of electric shock, fire and malfunction.
- ▶ Tighten the screw of terminal block with the specified torque range. If the terminal screw is loose, it can cause fire and electric shock.
- ▶ Use the PLC in an environment that meets the general specifications contained in this datasheet. Risk of electrical shock, fire, erroneous operation and deterioration of the PLC.
- ▶ Be sure that external load does not exceed the rating of output module. Risk of fire and erroneous operation.
- ▶ Do not use the PLC in the environment of direct vibration Risk of electrical shock, fire and erroneous operation.
- ▶ Do not disassemble, repair or modify the PLC. Risk of electrical shock, fire and erroneous operation
- ▶ When disposing of PLC and battery, treat it as industrial waste. Risk of poisonous pollution or explosion.

#### ■ Precautions for use

- ▶ Do not install other places except PLC controlled place.
- ▶ Make sure that the FG terminal is grounded with class 3 grounding which is dedicated to the PLC. Otherwise, it can cause disorder or malfunction of PLC



- ▶ Connect expansion connector correctly when expansion module is needed.
- ▶ Do not detach PCB from the case of the module and do not modify the module.
- ▶ Turn off power when attaching or detaching module.
- ▶ Cellular phone or walkie-talkie should be farther than 30cm from the PLC.
- ▶ Input signal and communication line should be farther than 10cm from a high-tension and a power line in order not to be affected by noise and magnetic field.

#### Related Manual

Read this data sheet carefully prior to any operation, mounting, installation or start-up of the product.

Na e	Code
XG5000 User's manual(Programming software)	10310000512
XGK Basic Instruction & Programming User's manual	10310000510
XGB Series user's manual	10310000694
XGB Hardware	10310000893

#### Revision History

Date	Version	Updated Information
2011.03	V1.0	First Edition
2011.05	V1.1	CI changed

#### Applicable version

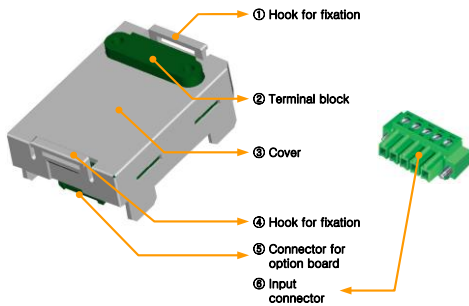
For system configuration, the following version is necessary.

Segment	Version
XGB E type	V1.11 or above
XGB S type	V1.11 or above
XGB SU type	V1.0 or above
XG5000	V3.61 or above

## 1. General Specifications

No	Item	Specification	Standard
1	Operating temperature	0 ~ 55℃	-
2	Storage temperature	-25 ~ 70℃	-
3	Operating humidity	5 ~ 95%RH, non-condensing	-
4	Storage humidity	5 ~ 95%RH, non-condensing	-
5	Vibration resistance	For discontinuous vibration	-
		Frequency Acceleration Amplitude	times
		10sf ≤ 57 Hz - 0.075 mm	10 times in each direction for X, Y, Z
		57 sf ≤ 150 Hz 9.8ms <sup>2</sup> (1G) -	
6	Shocks resistance	For continuous vibration	-
		Frequency Acceleration Amplitude	times
		10sf ≤ 57 Hz - 0.035 mm	10 times in each direction for X, Y, Z
		57 sf ≤ 150 Hz 4.9ms <sup>2</sup> (0.5G) -	
7	Noise resistance	Max. impact acceleration : 147 ms <sup>2</sup> (15G)	IEC61131-2
		Authorized time : 11ms	
		Pulse wave : Sign half-wave pulse (Each 3 times in X,Y,Z directions)	
		AC: ±1,500V DC: ±900V	
8	Ambient conditions	Square wave impulse noise	LSIS standard
		Electrostatic discharge	IEC61131-2
		Radiated electromagnetic field noise	IEC61000-4-2
		Fast transient burst noise	IEC61131-2
9	Operating height	Segment	IEC61000-4-3
		Power supply module	IEC61131-2
		Digital/analog input/output communication interface	IEC61000-4-4
		Voltage	2 kV
10	Pollution degree	1 kV	-
		2 kV	-
		1 kV	-
		1 kV	-
11	Cooling type	Natural air cooling	-

## 3. Parts Names and Descriptions



No.	Name	Description
①, ④	Hook for fixation	▶ Hook for fixing the option board to basic unit
②	Terminal block	▶ Terminal block for connecting external RTD temperature sensor
③	Cover	▶ Option board cover
⑤	Connector for option board	▶ Connection connector for connecting the option board to the basic unit
⑥	Input connector	▶ Wiring connector for connecting with the external device

## 4. Wiring

### (1) Precautions for wiring

- (a) Don't let AC power line near to RTD input option board's external output signal line. With an enough distance kept away between, it will be free from surge or inductive noise.
- (b) Don't let the cable too close to hot device and material or in direct contact with oil for long, which will cause damage or abnormal operation due to short-circuit.
- (c) Wiring with high-voltage line or power line may produce inductive hindrance causing abnormal operation or defect.

### (2) Wiring example

- (a) There are three types of wiring method to connect Pt100 or JPt100 to RTD input option board (2-line type, 3-line type and 4-line type)
- (b) For the wire used when Pt100 or JPt100 is away from the RTD input option board, resistance of the wire should be 10Ω or less per one wire. And wires for each channel should be same (thickness, length, type and etc.)
- (c) The gap between wires used for channels should be 1Ω or less. Otherwise, it may not meet the precision indicated at 3. performance specification.

Wiring	Connection example
2-line type	
3-line type	
4-line type	

#### Remarks

- \*1 : RTD (Pt100 or JPt100)
- \*2 : shield line – Connect the shield of RTD and wire to FG.

## 2. Performance Specifications

Item	Performance specification
Number of channel	1 channel
Input sensor type	PT100 JIS C1604-1997
Input temp. range	JPT100 JIS C1604-1981 , KS C1603-1991
Digital output	PT100 -200 ~ 600℃
Precision	JPT100 -200 ~ 600℃
Max. Conversion speed	PT100 -2000 ~ 6000
Insulation method	JPT100 -2000 ~ 6000
Terminal block	±1.0% or less
I/O occupation point	25ms – Note1)
Sensor wiring method	Non-insulation between input terminal and PLC basic unit
Additional function	5-point terminal block
Consumption current	Fixed type: 64 point
Weight	3-line type
	Averaging function
	Count-averaging process function
	Alarm function
	Detection of disconnection
	30mA
	20g

#### Remarks

Note1) Conversion speed may be delayed because of scan delay of XGB main module.

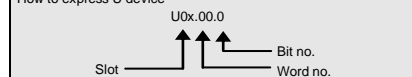
## 5. Internal memory

### (1) Conversion data I/O area (U device)

Variable	Type	Device	Comment	Read/Write	Signal direction
0x_ERR	Bit	U0x.00.0	Module error	Read	Option → CPU
0x_RDY	Bit	U0x.00.F	Module Ready		
0x_CH0_ACT	Bit	U0x.01.0	CH0 running		
0x_CH0_BOUT	Bit	U0x.01.4	CH0 disconnection		
0x_CH0_TEMP	Word	U0x.04	CH0 temp. conversion value		

#### Remarks

How to express U device

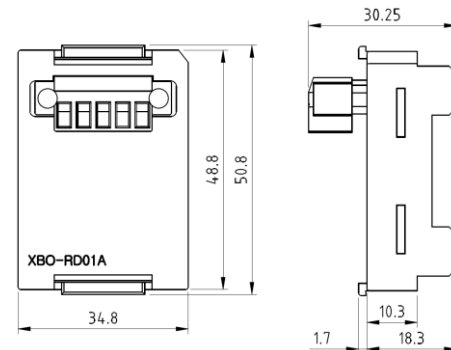


Ex1) CH0 temp. conversion value of the module at slot 9 -> U09.04  
Ex2) CH0 disconnection flag of the module at slot 9 -> U09.01.4

### (2) Operation parameter setting area

Address	Contents	Setting value	Read/Write	Instruction
0	Enable CH	0: Disable 1: Enable	Read/Write	PUT GET
1	Sensor type setting	0: PT100 1: JPT100		
5	Temp. unit setting	Data type setting 0: Celsius 1: Fahrenheit		
6	Disconnection information	0: Normal 1: Disconnection	Read	GET
14	CH0 count average setting	0 or 2-64,000	Read/Write	PUT GET
15	Error information	100: Sensor type setting error 300: Average setting error	Read	GET

## 6. Dimension (mm)



## 7. Warranty

- (1) Warranty period  
LSIS provides an 18-month-warranty from the date of the production.
- (2) Warranty conditions  
For troubles within the warranty period, LSIS will replace the entire PLC or repair the troubled parts free of charge except the following cases.
  - (a) The troubles caused by improper condition, environment or treatment except the instructions of LSIS.
  - (b) The troubles caused by external devices.
  - (c) The troubles caused by remodeling or repairing based on the user's own discretion.
  - (d) The troubles caused by improper usage of the product.
  - (e) The troubles caused by the reason which exceeded the expectation from science and technology level when LSIS manufactured the product.
  - (f) The troubles caused by natural disaster.
- (3) This warranty is limited to the PLC itself only. It is not valid for the whole system which the PLC is attached to.